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EXAMINER	
OLSEN, KAJ K	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,981	VIGH, GYULA	
	Examiner	Art Unit	
	KAJ K. OLSEN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30 and 35-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30 and 35-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it is too long. The examiner did a computer word count on applicant's abstract and the computer found it contained over 250 words. MPEP § 608.01(b) states abstracts must be 150 words or less.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-22, 24-30, and 35-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. Claim 1 is drawn to the use of one of two options where at least one of these options detected the focused ampholyte in a separation compartment at an increased concentration. The examiner is confused by this. In particular, the examiner doesn't understand how the use of option one (i.e. the addition of auxiliary compartments) can be construed as improving the concentration as the specification doesn't appear to have ever demonstrated this. For example, fig. 2 and the associated text show how option two (i.e. the addition of auxiliary agents)

improves the concentration because the sample ampholyte is now confined to a smaller area 28 of the separation tube because of the addition of auxiliary agents. Fig. 3 adds option one to the use of option two from fig. 2 and would appear to show that the additional compartments actually *reduce* the concentration of the ampholyte as the ampholyte confined in space 28 in fig. 2 can now take up the entire space 42 of fig. 3. This is not in any reasonable sense an increase in ampholyte concentration. In paragraph 0035, applicant states that the concentration of the ampholyte sample and carrier is enhanced by a factor of (Vauxanode + Vsep + Vauxcathode) /Vsep, but the origin of this equation is never explained and does not make sense to the examiner. Comparing fig. 1 and 3, how is there any increase in ampholyte concentration between these two embodiments? In fig. 1, the sample and carrier ampholytes are confined to capillary 16 and the concentration of ampholyte in 16 would be the moles of ampholyte divided by the volume of the capillary. In fig. 3, the sample and carrier ampholytes are confined to capillary 42 with the auxiliary agents filling spaces 38 and 46. The concentration of ampholytes would then be the moles of ampholytes divided by the volume of capillary, which is the same as in fig. 1. The examiner does not see how this constitutes an enhancement. If you started with the same amount of sample for the embodiments of fig. 1 and 3, you would end up with the same final concentration of sample as the samples in fig. 1 and 3 are confined to analogous spaces.

5. Moreover, even if the examiner accepted that fig. 3 somehow represents an enhancement over the embodiment of fig. 1, it is still unclear how the additional volume alone (option one) can constitute an enhancement. For example, if you took a given concentration of sample for the experiment, the final concentration of sample would only change with volume *if* you also added the auxiliary agent (option two). For the purpose of example, if we assume the capillaries 16 or

42 of fig. 1 and 3 are 10 ml and the combined volume of compartments 38 and 46 are 40 ml, a 10^{-5} M sample would be 10^{-5} M whether it were confined to just the 10 ml (fig. 1) or to the 50 ml (fig. 3). The enhancement would only come if one added auxiliary agents (option two) to force the sample to take up a smaller volume of the 50 ml (fig. 3) or 10 ml (like the embodiment of fig. 2 does to the embodiment of fig. 1). Hence, there doesn't appear to be any way an increase volume *by itself* can improve the concentration unless that increased volume is complemented with the use of an auxiliary agent. However, claim 1 states that the improvement can be arrived at with "option one or option two" (emphasis added). Similarly, claim 2 states that the increased concentration could be from the "use of an auxiliary compartment or an auxiliary agent" (emphasis added). Claim 22 is drawn to an increased concentration and only specifies the use of auxiliary compartments and does not discuss the use of auxiliary agents. Claim 37 explicitly states that the increase concentration is provided in comparison with an analysis without the at least one auxiliary compartment. Applicant never explained how the use of these auxiliary compartments only can improve the concentration of the isoelectric focusing system and one possessing ordinary skill in the art would not be enabled by the disclosure to make and use the device of these claims.

6. The examiner notes that claims 23 and 35 are not included in the enablement rejection above because applicant does appear to have support for an increased concentration over that seen without the auxiliary compartment and auxiliary agent (claim 23) or without the auxiliary agent (claim 35).

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 3-4, 7-30, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigh et al. (US 2002/0043465) in view of Valmet (USP 3,616,456). Valmet is being cited and relied on for the first time with this office action.

9. As discussed in the previous office actions of 7/14/2008 and 9/6/2007, Vigh set forth all the limitations of the claims. Applicant has amended claims 1, 22, 23, and 37 to specify that the separation compartment does not include a separation membrane. Valmet teaches the use of an isoelectric gradient that is maintained by individual compartments defined by transverse walls 9. Valmet teaches that although a membrane 14 may be useable to separate the various compartments, such a membrane is not necessary. Compare the embodiments of fig. 2 and 7 and see col. 6, ll. 45-63. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Valmet and utilize the device of Vigh without separation membranes because said membranes have been found to induce electroosmosis and have been found by the prior art to not always be necessary. Furthermore, an analysis without membranes would presumably have been more rapid as the sample and carrier ampholytes would be able to more quickly establish the desired pH gradient when a membrane is not present to inhibit fluid transfer. With respect to the limitations drawn to the use of the auxiliary compartments improving the concentration of the focused ampholyte analyte, as discussed in the 112 rejection above, it is unclear how the present invention improves the concentration based on the use of auxiliary compartments alone. Moreover, adjusting the

volume or the amount of compartments for an isoelectric focusing experiment requires only routine skill in the art. See Valmet col. 6, ll. 45-63 and col. 8, ll. 12-20. Hence, even if the examiner accepted that the presence of additional auxiliary compartments would improve the concentration of analyte without the further presence of auxiliary agents as well, because adjusting the volume and/or the number of compartments an experiment is obvious to one of ordinary skill in the art, the use of additional compartments would have then inherently improved the concentration of the experiment of Vigh in view of Valmet.

10. With respect to claim 23, in addition to the reasons discussed in the previous office actions, this examiner further notes that having a chamber "configured to contain" to the set forth solutions does not further define the actual chamber. Any chamber is inherently configured to contain these solutions whether or not the chambers of the prior art actually discloses these solutions. What one places in the claimed chambers constitutes how the device is to be utilized and doesn't further define the device. Furthermore, Valmet discloses a detector system that can detect the analyte at any number of focusing positions. See fig. 7 and 8 and col. 9, ll. 16-37.

11. With respect to claim 24, see previous discussion of Vigh (e.g. paragraph 64 from the 7/17/2008 rejection) and further note that Valmet renders obvious the use of many compartments to affect an even greater degree of separation (col. 8, ll. 12-20).

12. Claims 1, 7-24, 27, 29-30, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speicher et al. (US 6, 638,408) in view of Valmet.

13. As discussed in the previous office actions of 7/14/2008 and 9/6/2007, Speicher set forth all the limitations of the claims. Applicant has amended claims 1, 22, 23, and 37 to specify that the separation compartment does not include a separation membrane. Valmet teaches the use of

an isoelectric gradient that is maintained by individual compartments defined by transverse walls 9. Valmet teaches that although a membrane 14 may be useable to separate the various compartments, such a membrane is not necessary. Compare the embodiments of fig. 2 and 7 and see col. 6, ll. 45-63. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Valmet and utilize the device of Speicher without separation membranes because said membranes have been found to induce electroosmosis and have been found by the prior art to not always be necessary. Furthermore, an analysis without membranes would presumably have been more rapid as the sample and carrier ampholytes would be able to more quickly establish the desired pH gradient when a membrane is not present to inhibit fluid transfer. With respect to the limitations drawn to the use of the auxiliary compartments improving the concentration of the focused ampholyte analyte, as discussed in the 112 rejection above, it is unclear how the present invention improves the concentration based on the use of auxiliary compartments alone. Moreover, adjusting the volume or the amount of compartments for an isoelectric focusing experiment requires only routine skill in the art. See Valmet col. 6, ll. 45-63 and col. 8, ll. 12-20. Hence, even if the examiner accepted that the presence of additional auxiliary compartments would improve the concentration of analyte without the further presence of auxiliary agents as well, because adjusting the volume and/or the number of compartments an experiment is obvious to one of ordinary skill in the art, the use of additional compartments would have then inherently improved the concentration of the experiment of Speicher in view of Valmet.

14. Claims 1, 3, 4, 7-15, 17-30, and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shave et al. ("Preparative-scale, recirculating, pH-biased binary isoelectric

trapping separations", Electrophoresis, Volume 25, 2004, pp. 381-387, published online 19 January 2004) in view of Valmet.

15. As discussed in the previous office actions of 7/14/2008 and 9/6/2007, Shave set forth all the limitations of the claims. Applicant has amended claims 1, 22, 23, 35 and 37 to specify that the separation compartment does not include a separation membrane. Valmet teaches the use of an isoelectric gradient that is maintained by individual compartments defined by transverse walls 9. Valmet teaches that although a membrane 14 may be useable to separate the various compartments, such a membrane is not necessary. Compare the embodiments of fig. 2 and 7 and see col. 6, ll. 45-63. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Valmet and utilize the device of Shave without separation membranes because said membranes have been found to induce electroosmosis and have been found by the prior art to not always be necessary. Furthermore, an analysis without membranes would presumably have been more rapid as the sample and carrier ampholytes would be able to more quickly establish the desired pH gradient when a membrane is not present to inhibit fluid transfer. With respect to the limitations drawn to the use of the auxiliary compartments or auxiliary agents for improving the concentration of the focused ampholyte analyte, as discussed in the 112 rejection above, it is unclear how the present invention improves the concentration based on the use of auxiliary compartments alone. Moreover, adjusting the volume or the amount of compartments for an isoelectric focusing experiment requires only routine skill in the art. See Valmet col. 6, ll. 45-63 and col. 8, ll. 12-20. Hence, even if the examiner accepted that the presence of additional auxiliary compartments would improve the concentration of analyte without the further presence of auxiliary agents as

well, because adjusting the volume and/or the number of compartments an experiment is obvious to one of ordinary skill in the art, the use of additional compartments would have then inherently improved the concentration of the experiment of Shave in view of Valmet. Furthermore, Shave teaches the addition of auxiliary agents to the isoelectric focusing experiment (see the previous office actions), which the applicant evidences would inherently improve the concentration of ampholyte sample.

16. With respect to claim 24, Valmet already disclosed the presence of many different compartments (col. 8, ll. 12-20), which would read on the defined compartments of this claim.

17. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigh in view of Valmet as applied to claim 1 above, and in further view of Hofmann et al. ("Adaptation of Capillary Isoelectric Focusing to Microchannels on a Glass Chip", Analytical Chemistry, Vol. 71, No. 3, February 1, 1999, pp. 678 - 686).

18. Vigh and Valmet discloses the method as discussed with regards to claim 1. Regarding claims 5 and 6, Vigh does not explicitly disclose the isoelectric focusing system to be a chip-based isolectric focusing system. Hofmann teaches a chip-based isolectric focusing system (see fig. 1 and abstract). It would have been obvious to one of ordinary skill in the art to have adapted the capillary imaging isolectric focusing system of Vigh ('465) to a chip-based system as taught by Hofmann because it provides the benefit of miniaturization which translates to low cost, speed and portability as explained by Hofmann (page 679, 2nd full paragraph on left hand column).

19. Claims 3 - 4, 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speicher in view of Valmet as applied to claims 1, 22, and 23 above, and in further view of Pawliszyn (US 5,784,154).

20. Speicher and Valmet disclose the method as discussed with regards to claim 1 above. Regarding claims 3 and 4, Speicher discloses a chamber (100) wherein isoelectric focusing occurs. Speicher does not expressly disclose the isoelectric focusing system is a capillary isoelectric focusing system. Pawliszyn teaches an imaging capillary isoelectric focusing system as an improvement over isoelectric focusing performed in chambers (column 2, lines 27 - 32 and column 18, lines 48- 51). It would have been obvious to one of ordinary skill in the art to have modified the isoelectric focusing system of Speicher and Valmet to an imaging capillary isoelectric focusing system as taught by Pawliszyn because as Pawliszyn explains it has the benefit of efficient dissipation of Joule heat, eliminates convection effects which occur in large chambers and enables highly efficient separations (col. 2, ll. 27-32).

21. Speicher and Valmet disclose the apparatus as discussed with regards to claim 22 above. Regarding claims 25 -26 and 28, Speicher discloses a chamber (100) wherein isoelectric focusing occurs. Speicher does not expressly disclose the isoelectric focusing system is a capillary isoelectric focusing system or an imaging isoelectric focusing system. Pawliszyn teaches an imaging capillary isoelectric focusing system as an improvement over isoelectric focusing performed in chambers (column 2, lines 27 - 32 and column 18, lines 48 - 51). It would have been obvious to one of ordinary skill in the art to have modified the isoelectric focusing system of Speicher and Valmet to an imaging capillary isoelectric focusing system as taught by Pawliszyn because as Pawliszyn explains it has the benefit of efficient dissipation of Joule heat,

eliminates convection effects which occur in large chambers and enables highly efficient separations (column 2, lines 27 - 32).

22. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speicher in view of Valmet as applied to claim 1 above, and in further view of Pawliszyn and Hofmann.

23. Speicher and Valmet disclose the method as discussed with regards to claim 1 above. Regarding claims 5 and 6, Speicher discloses a chamber (100) wherein isoelectric focusing occurs. Speicher does not expressly disclose the isoelectric focusing system is a chip-based isoelectric focusing system. Pawliszyn teaches an imaging capillary isoelectric focusing system as an improvement over isoelectric focusing performed in chambers (column 2, lines 27 - 32 and column 18, lines 48 - 51). It would have been obvious to one of ordinary skill in the art to have modified the isoelectric focusing system of Speicher to an imaging capillary isoelectric focusing system as taught by Pawliszyn because as Pawliszyn explains it has the benefit of efficient dissipation of Joule heat, eliminates convection effects which occur in large chambers and enables highly efficient separations (column 2, lines 27 - 32).

24. Pawliszyn does not explicitly disclose the imaging capillary isoelectric system to be a chip-based system. Hofmann teaches a chip-based isoelectric focusing system (see fig. 1 and abstract). It would have been obvious to one of ordinary skill in the art to have adapted the capillary imaging isoelectric focusing system of Speicher in view of Valmet and Pawliszyn to a chip-based system as taught by Hofmann because it provides the benefit of miniaturization which translates to low cost, speed and portability as explained by Hofmann (page 679, 2nd full paragraph on left hand column).

25. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shave in view of Valmet as applied to claim 1 above, and in further view of Hofmann.

26. Shave discloses the method as discussed with regards to claim 1 above. Regarding claims 5 and 6, Shave does not explicitly disclose the isoelectric focusing system is a chip-based isoelectric focusing system. Hofmann teaches a chip-based isolectric focusing system (see fig. 1 and abstract). It would have been obvious to one of ordinary skill in the art to have adapted the capillary imaging isolectric focusing system of Shave and Valmet to a chip-based system as taught by Hofmann because it provides the benefit of miniaturization which translates to low cost, speed and portability as explained by Hofmann (page 679, 2nd full paragraph on left hand column).

27. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shave in view of Valmet as applied to claim 1 above, and in further view of Wu et al. (US 5,985,121).

28. Shave and Valmet disclose the method as discussed with regards to claim 1 above. Regarding claim 16, Shave does not explicitly disclose one or more of the auxiliary agents fluoresce. Wu teaches an apparatus and a method of using the same for isoelectric focusing with a universal refractive index gradient imaging detector, an optical absorption imaging detector, and a fluorescence imaging detector (column 2, lines 57 - 62). It would have been obvious to one of ordinary skill in the art to have included the auxiliary agents that fluoresce to be detected by the fluorescence imaging detector taught by Wu in the method of Shave and Valmet because Wu explains that these detectors overcome problems arising from mobilization process associated with conventional on-column detectors through the use of their new on-line, real-time imaging detector (column 2, lines 54 - 57).

Response to Arguments

29. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

30. The examiner notes that the art rejections of claim 2 have been withdrawn. None of Vigh, Speicher, or Shave disclose or render obvious adjusting the amount of auxiliary agents added to the sample solution and detecting a desired second focusing position. The examiner sees no discussion in any of these references about adjusting an auxiliary agent level and detecting a second focussing position in the separation compartment. The teaching of Shave comes the closest. However, the purpose of the auxiliary agent in Shave appears to be not to move the location of the focused ampholyte analyte, but rather to increase the analyte's solubility during focusing. Claim 2 lacks enablement (see above) so no allowability of the claim can be determined at this point.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
January 21, 2009